

CALFED Ecosystem Restoration Program Stepdown Objectives Technical Appendix

These are prototypes for two approaches to presenting implementation objectives and targets in the CALFED stepdown objective format. One format follows the CALFED stepdown objective format very closely, while the other example reformats the objectives by placing them before the implementation objectives and targets.

Draft: For Discussion Only

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Appendix 14. CALFED Ecosystem Quality Objectives - Sacramento River Ecological Zone

ZONE NUMBER: 14

ZONE DESCRIPTION: The Sacramento River Ecological Zone includes the mainstem of the Sacramento River from Keswick Dam (river mile 302) near Redding to the "I" Street bridge (river mile 60) in Sacramento.

ECOLOGICAL SUBUNITS:

1. Keswick Dam (river mile 302) to the Red Bluff Diversion Dam (river mile 243).
2. Red Bluff Diversion Dam (river mile 243) to Chico Landing (river mile 194).
3. Chico Landing (river mile 194) to Colusa (river mile 143)
4. Colusa (river mile 143) to Verona (river mile 80).
5. Verona (river mile 80) to Sacramento (river mile 60).

CALFED MISSION: The mission of the CALFED Bay-Delta Program is to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

CALFED GOAL: Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.

SUMMARY OF TARGETS FOR SACRAMENTO RIVER ECOLOGICAL ZONE:
(To be Prepared. Table by resource element and ecological unit)

ECOLOGICAL UNIT 1: SACRAMENTO RIVER REACH FROM KESWICK DAM TO RED BLUFF DIVERSION DAM

Applicable CALFED Objectives and Subobjectives

Objective A: Improve and increase aquatic habitats so that they can support sustainable production and survival of native and other desirable estuarine and anadromous fish in the estuary.

Subobjective 8: Reduce concentrations of toxic constituents and their bioaccumulation to eliminate their adverse effects on populations of fish and wildlife species.

Subobjective 8b: Reduce the concentrations of hydrocarbons, heavy metals, and other pollutants in Bay-Delta system water and sediments.

Concentrations of pollutants in the Sacramento River and Delta are to be maintained at

safe levels in part by providing adequate flows in this reach to dilute pollutant water entering from Spring Creek near Keswick Dam.

CALFED Objective C: Increase population health and populations size of Delta species to levels that assure sustained survival.

CALFED Subobjective 1: Contribute to the recovery of threatened, endangered or species of special concern.

Actions taken in this eco-unit are prescribed in large part to contribute to the recovery of winter-run chinook salmon, spring-run chinook salmon, green sturgeon, and steelhead.

CALFED Subobjective 2: Increase populations of economically important species.

Actions taken in this ecounit are also prescribed to increase populations of fall and late-fall chinook salmon and white sturgeon.

Implementation Objectives, Targets, and Action Options

From the above program objectives and subobjectives the following list of resource elements requiring attention in order to meet objectives was generated:

Ecosystem Processes and Functions

- Hydrograph
- Gravel Recruitment
- Gravel Transport and Cleansing

Stressors

- Water Management and Diversions
- Water Temperature
- Gravel Mining
- Contaminants
- Fish Harvest
- Predation and Competition

Primary Physical Process Resource Element: Hydrograph

Implementation Objective A: Restore some of the basic features of the natural hydrograph by shifting flows seasonally to better represent natural seasonal flow patterns.

Implementation Objective Rationale: The historic hydrograph in this reach of the Sacramento River is disrupted primarily by water storage in Lake Shasta behind Shasta Dam, especially in late winter and early spring of drier years. Adjusting the hydrograph

may improve flows for spawning, rearing, and migration of salmon and steelhead, and improve gravel recruitment, transport, and cleansing.

Target: More closely emulate the natural hydrograph in most year types by providing a late-winter or spring pulse of flow.

Target Rationale: Providing a late-winter or spring pulse flow of sufficient magnitude to attract and sustain adult salmon, steelhead, and sturgeon, to improve transport juvenile fish downriver, and to improve gravel recruitment, transport, and cleansing processes will help to maintain and enhance populations of salmon, steelhead, and sturgeon.

Action and Implementation Level: Supplement normal operating flows from Shasta and Keswick dams with releases from Lake Shasta in the March to increase flows to needed pulsed levels (monthly average of approximately 5,000-10,000 cfs in drier years and 15,000-20,000 cfs in median water years).

Action and Implementation Level Rationale: Pre-Shasta and unimpaired flows are in the specified ranges. Such "natural" flows are believed to be necessary to protect spawning and rearing salmon and steelhead, and the habitats they depend on.